[0058] In operation **502**, the presence of liquid is detected. In one example, one or more sensors are used to detect the presence of liquid within the cavity or other portion of an acoustic module. An example sensor is discussed above with respect to FIGS. **3**A-B, above. As previously discussed, the sensor may include a pressure sensor, an optical sensor, a moisture sensor, a conductive sensor, or the like. In some embodiments, the microphone element of the device is used as an acoustic sensor to detect the presence of liquid in the acoustic module. The sensor may be used to directly or indirectly detect the presence of liquid in the acoustic module. For example, the sensor may directly sense the presence of liquid in the module by detecting a change in optical, electrical, or moisture conditions as compared to reference conditions when the module is dry. In another example, an acoustic sensor may be used and may indirectly detect the presence of liquid in the acoustic cavity by detecting a tone or acoustic pulse produced by the speaker or other acoustic element. In general, the presence of a liquid may dampen or alter the acoustic response of an acoustic module. The acoustic response may be measured using the sensor and compared to a reference response to detect the presence of liquid in the acoustic cavity or other portions of the acoustic module. As discussed previously, a microphone element of a microphone module may also be used as a sensor for purposes of operation **502**.

[0059] If the presence of liquid is detected in operation **502**, operation **504** is performed. In operation **504**, a charge is applied to an element of the acoustic module. In one example, a charge is applied to a portion of an interior surface of a cavity of the acoustic module. For example, a surface charge may be applied using at least one conductive element that is proximate to the interior surface. Typically, the surface charge changes the hydrophobicity of the surface due to the change in surface energy caused by the application of a surface charge.

[0060] In some cases, a charge is applied to a series of conductive elements in a synchronized manner. For example, a series of conductive elements may be arranged along a direction of the surface of the cavity. A charge may be applied to each of the conductive elements in sequence resulting in a surface charge that moves along the direction of the surface. Additionally, multiple charges may be simultaneously applied using multiple conductive elements arranged along the surface of the cavity.

[0061] In operation **506**, the liquid is moved within the cavity. As discussed above with respect to FIGS. **4**A-C, applying a charge to a region of a surface of the cavity may change the hydrophobicity of that region of the surface. By selectively applying a charge using one or more conductive elements, the change in hydrophobicity may tend to change the contact angle of a respective portion of the liquid tending to move it toward or away from a corresponding region of the surface. In one example, a positive charge is applied using a first conductive element to reduce the hydrophobicity of a corresponding region of the cavity. The decrease in the relative hydrophobicity may draw or attract liquid to that region by decreasing the contact angle and promoting wetting of the region. In addition, a different charge may be applied to a second conductive element that is proximate to the first conductive element resulting in a relative increase in the hydrophobicity of a corresponding region of the cavity. The increase in the relative hydrophobicity may increase the contact angle, decreasing wetting of the region and facilitate movement of the liquid way from that region and toward an area of lower hydrophobicity. Thus, selective application of a charge in operation **504** can be used to move the liquid within the cavity.

[0062] In some cases, a series of conductive elements are used to sequentially apply a charge down a length of the cavity. In this case, the charge, and thus the change in hydrophobic properties, may propagate along the surface like a wave. The charge wave may be used to drive a portion of the liquid along the length of the cavity. In some cases, multiple charge waves are used to drive the liquid toward one end of the cavity.

[0063] In some cases, one or more conductive elements may be used to generate a charge that draws a portion of the liquid toward the acoustic element (e.g., speaker). In this case, some of the liquid can be held back, while the remainder of the liquid is drawn toward the opening of the cavity for expulsion. This technique may be advantageous when, for example, the volume of liquid trapped in the cavity is too large to efficiently evacuate all at once. In some cases, this technique is repeated resulting in small portions of liquid being moved toward the opening of the cavity, while some portion of liquid is held back against the acoustic element or other region of the cavity.

[0064] As part of operation **506**, additional techniques may be applied to assist with the movement of the liquid. For example, if the acoustic module includes a speaker element, one or more acoustic energy pulses may be generated in conjunction with the application of the charge in operation **504**. In some cases, the one or more acoustic pulses helps to drive a portion of the liquid toward one end of the cavity. In another example, a positive charge may be applied to the protective screen or other element to facilitate movement of the liquid toward the opening of the cavity.

[0065] In operation **508**, at least a portion of the liquid is expelled from the cavity through an orifice. In one example, the movement of the liquid of operation **506** is sufficient to drive at least a portion of the liquid out of the cavity. In some cases, multiple techniques are applied to expel the liquid from the cavity and through the orifice. For example, a charge may be applied using one or more conductive elements that are located proximate to the opening of the cavity. In conjunction, a positive surface charge may be selectively applied to modify the hydrophobic properties of the protective screen. For example, a positive charge may be applied to the protective screen, reducing the hydrophobic properties of the screen, thereby facilitating passage of liquid through the screen. Additionally, one or more acoustic energy pulses may be generated facilitating the expulsion of at least a portion of the liquid through an orifice and out of the acoustic cavity.

[0066] In some cases, additional optional operations may be performed to monitor the liquid removal process. For example, in some cases, a tone or acoustic signal may be generated by the speaker or other acoustic element of the acoustic module. Because the presence of liquid may affect the acoustic response of the acoustic module, the tone or acoustic signal may indicate the presence or quantity of liquid remaining in the acoustic module. In one example, an acoustic sensor (e.g., a microphone) may be used to measure and quantify the tone or acoustic signal. The measurement of the tone or acoustic signal produced by the acoustic module may be compared to a known reference measurement that represents the acoustic response of the acoustic module when dry. Based on the comparison between the measured response and